Amendments to the claims

Please cancel claim 1 and 38 without prejudice or disclaimer of their subject matter, and amend claims 34, 35, 44, 48 and 53. The following listing of claims replaces all prior versions of the claims and all prior listings of the claims in the present application.

Claims 1 - 33 (canceled)

34. (currently amended) A method of moulding and curing tyres for vehicle wheels, comprising the steps of:

disposing a tyre being processed on a toroidal support, wherein an outer surface of the toroidal support substantially mates with an inner surface of the tyre;

enclosing the tyre and the toroidal support inside a moulding cavity defined in a vulcanization mould, the moulding cavity having walls, wherein a shape of the moulding cavity walls matches an outer surface of the tyre when vulcanization is completed;

pressing the outer surface of the tyre against the moulding cavity walls; and

administering heat to the tyre to cause molecular crosslinking of the tyre;

wherein the pressing step comprises the steps of:

compressing side portions of the tyre between the moulding cavity walls and the outer surface of the toroidal support, concurrently with the enclosing step, wherein the side portions extend from inner circumferential edges of the tyre to transition regions between sidewalls, located at respective side portions, and a tread band disposed at a radially-outer portion of the tyre, delimited between the side portions; and

~~imposing an expansion to~~ expanding a radially-outer portion of the tyre to bring the radially-outer portion of the tyre against the walls of the moulding cavity, said radially-outer

portion being delimited between the side portions, ~~to bring the radially outer portion of the tyre against the walls of the moulding cavity,~~

wherein said expanding step includes a step of admitting a fluid under pressure, and, before the expanding step, admitting a working fluid between the outer surface of the toroidal support and the inner surface of the tyre, wherein the working fluid is under a lower pressure than that of the fluid under pressure admitted during the expanding step.

35. (currently amended) The method of claim 34, wherein ~~tyre expansion is carried out by admitting a~~ the fluid under pressure is admitted to at least one diffusion interspace created between the outer surface of the toroidal support and the inner surface of the tyre.

36. (previously presented) The method of claim 35, wherein, before admission of the fluid under pressure, the inner surface of the tyre substantially adheres, over a whole extension of the inner surface of the tyre, to the outer surface of the toroidal support, and wherein the diffusion interspace is created during tyre expansion.

37. (previously presented) The method of claim 34, wherein admission of the fluid under pressure takes place through feeding channels formed in the toroidal support and opening onto the outer surface of the toroidal support.

38. (canceled)

39. (previously presented) The method of claim 35, wherein heat administration takes place by admission of a heating fluid to the diffusion interspace, and wherein the heating fluid comprises a same fluid under pressure as employed for carrying out the pressing step.

40. (previously presented) The method of claim 35, wherein the fluid under pressure is introduced into an upper portion of the moulding cavity and guided along an inner surface of the toroidal support towards a lower portion of the moulding cavity.

41. (previously presented) The method of claim 40, further comprising a step of drawing the fluid under pressure out of the lower portion of the moulding cavity, carried out concurrently with introducing the fluid under pressure, to create a pressurized fluid stream along the inner surface of the toroidal support and the diffusion interspace.

42. (previously presented) The method of claim 40, wherein a rotational movement around a geometric axis of the toroidal support is imparted to the fluid under pressure introduced into the moulding cavity.

43. (previously presented) The method of claim 35, wherein the diffusion interspace has an extension between 3 mm and 14 mm, measured between the inner surface of the tyre and the outer surface of the toroidal support, at least at an equatorial plane of the tyre.

44. (currently amended) The method of claim 34, wherein the ~~expansion~~ expanding step involves an increase in the tyre circumference between 1% and 3.5%, measured at an equatorial plane of the tyre.

45. (previously presented) The method of claim 34, wherein the step of disposing the tyre on the toroidal support is carried out by directly manufacturing the tyre on the toroidal support.

46. (previously presented) The method of claim 35, wherein, before admission of the fluid under pressure, a treatment of the inner surface of the tyre is carried out to prevent permeation of the fluid under pressure through an elastomer material forming the tyre.

47. (currently amended) The method of claim 35, wherein a prevulcanized liner is directly formed on the toroidal support during a preliminary step to prevent permeation of the first fluid under pressure through an elastomer material forming the tyre.

48. (currently amended) An apparatus for moulding and curing tyres for vehicle wheels, comprising:

a toroidal support arranged to engage a tyre being processed, the toroidal support having an outer surface substantially mating with an inner surface of the tyre;

a vulcanization mould arranged to receive the toroidal support carrying the tyre within a moulding cavity having a holding space delimited between the outer surface of the toroidal support and walls of the moulding cavity;

pressing devices for pressing an outer surface of the tyre against the walls of the moulding cavity; ~~and~~

heating devices for transmitting heat to the tyre enclosed in the moulding cavity; and

at least one guide duct extending along an inner surface of the toroidal support;

wherein, under a closed condition of the vulcanization mould, the holding space has radially-inner portions and a radially-outer portion, wherein the radially-inner portions have shapes and sizes substantially corresponding to shapes and sizes of respective side portions of the tyre, and wherein the radially-outer portion has radial dimensions greater than radial dimensions of a radially-outer portion of the tyre.

49. (previously presented) The apparatus of claim 48, wherein the pressing devices comprise channels for feeding fluid under pressure which are formed through the toroidal support and open onto the outer surface of the toroidal support.

50. (previously presented) The apparatus of claim 48, wherein, when the vulcanization mould is closed, the holding space has a greater volume than a volume taken up by the tyre.

51. (previously presented) The apparatus of claim 49, wherein the feeding channels open into at least one interspace for diffusion of the fluid under pressure, defined in a radially-

outer portion of the holding space, between the outer surface of the toroidal support and the inner surface of the tyre.

52. (previously presented) The apparatus of claim 48, wherein the outer surface of the toroidal support has an extension less than an extension of the inner surface of the tyre after vulcanization is completed.

53. (currently amended) The apparatus of claim 49, ~~further comprising~~ wherein the at least one guide duct directs ~~for~~ the fluid under pressure ~~extending along an inner surface of the toroidal support and terminating~~ and terminates at the feeding channels.

54. (previously presented) The apparatus of claim 53, wherein the at least one guide duct is confined between the inner surface of the toroidal support and a filling structure fastened to the inside of the toroidal support.

55. (previously presented) The apparatus of claim 54, wherein the filling structure has an outer surface substantially extending parallel to the inner surface of the toroidal support.

56. (previously presented) The apparatus of claim 54, wherein the filling structure comprises an upper portion having an outer surface substantially parallel to the inner surface of the toroidal support, and a lower portion having a base surface with an inclined orientation relative to a horizontal plane.

57. (previously presented) The apparatus of claim 53, wherein the pressing devices comprise circumferentially-distributed admission nozzles oriented toward an end of the at least one guide duct.

58. (previously presented) The apparatus of claim 57, wherein the admission nozzles are oriented toward an inlet end of the at least one guide duct disposed above an equatorial plane of the toroidal support.

59. (previously presented) The apparatus of claim 57, wherein the admission nozzles have an inclined orientation relative to a direction radial to a geometric axis of the toroidal support.

60. (previously presented) The apparatus of claim 49, comprising at least a first and a second series of the feeding channels, located at respectively opposite positions relative to an equatorial median plane of the toroidal support and oriented toward directions respectively converging away from a geometric axis of the toroidal support.

61. (previously presented) The apparatus of claim 48, wherein the toroidal support has at least one centering shank for engagement in a centering seating associated with the vulcanization mould for fixing positioning of the toroidal support and the tyre in the moulding cavity.

62. (previously presented) The apparatus of claim 61, wherein the centering shank extends along a geometric axis common to the toroidal support, to the tyre, and to the moulding cavity.

63. (previously presented) The apparatus of claim 49, wherein the heating devices preferably comprise at least one duct to send a heating fluid to the feeding channels.

64. (previously presented) The apparatus of claim 63, wherein the heating fluid comprises a same fluid as the fluid under pressure.

65. (previously presented) The apparatus of claim 48, wherein the toroidal support has a structure elastically yielding in an axial direction, at least at regions corresponding to inner circumferential edges of the tyre.

66. (previously presented) The apparatus of claim 48, wherein the toroidal support has a structure elastically yielding in an axial direction, at least at regions corresponding to the side portions of the tyre.